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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/842,114 | 04/26/2001 | Jun Hatakeyama | KOJIM-393 | 6760 |

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EXAMINER

ASHTON, ROSEMARY E

ART UNIT PAPER NUMBER

1752

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/842,114 | HATAKEYAMA ET AL. | |
| | Examiner | Art Unit | |
| | Rosemary E. Ashton | 1752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 10-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-12, 14 and 21-33 is/are rejected.
- 7) ☒ Claim(s) 13 and 15-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

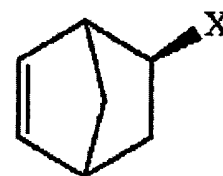
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1,2,3,4,6,7,10-12,14,21-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Fryd et al U.S. patent no. 6,503,686.

In example 14 Fryd teaches a photoresist composition comprising a polymer, a photoacid generator and a solvent. The polymer poly(AN/NB-F-O-MOM/tBMA) has a monomer of t-butyl methacrylate and a monomer of NB-F-O-MOM which is shown col. 15 and below. T-butyl is an acid labile group. The polymer meets the limitations of claims 1 and 2. It has the formulas in claims 11,12 and 14

NB—OAc
NB—OH
NB—F—OH
NB—F—OMOM

X = OCOCH₃
X = OH
X = OCH₂C(CF₃)₂OH
X = OCH₂C(CF₃)₂OCH₂OCH₃



in that in claims 11 and 12 it meets the limitation of (2)-5 and (3)-1 in that R5 is a fluorinated alkyl with an ether bond. In claim 14 it meets the limitations of (5)-1 in that R13 is an acid labile t-butyl group.

The composition has a dissolution inhibitor of t-butyl lithocholate and a resolution enhancer (col. 10 and 12).

The method limitations claimed are taught in col. 12-col. 14 with preferential exposure at 157 nm using a photomask followed by development (col. 13, lines 1-27).

The polymer has a mol. wt. of 40,000 as taught in col. 7, lines 57-58.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fryd et al cited above in view of Trefona III et al U.S. patent no. 6,136,501.

Fryd teaches the composition may have additives such as resolution enhancers, adhesion promoters, coating aids and surfactants, however, it does not teach the composition has a basic compound (col. 12, lines 44-50).

In col. 12 Trefonas teaches 'basic compounds such as TBAH enhance resolution.

A preferred optional additive of resists of the invention is an added base, particularly tetrabutylammonium hydroxide (TBAH), or tetrabutylammonium lactate, which can enhance resolution of a developed resist relief image. For

It would have been obvious to one of ordinary skill in the art to use a basic compound such as TBAH in the photoresist composition of Fryd with a reasonable expectation of obtaining a photoresist having enhanced resolution of a developed image because Fryd teaches the composition can contain a resolution enhancer and Trefonas teaches resolution enhancers in the art are basic compounds that enhance resolution of the developed relief image.

5. Claims 1,2,3,4,7-12,14,21-28,30-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Fedynyshyn U.S. patent no. 6,468,712.

In examples 2,5 and 9 Fedynyshyn teaches polymers for a chemically amplified photoresist comprising a PAG and solvent. The polymer in example 2 has formulas (2)-2 and (3)-1 in claims 11 and

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12 and the polymer in example 9 has formulas (2)-5 and (3)-1 in claims 11 and 12 as well as an acid labile t-butyl acrylate monomer. R5 is a fluorinated alkyl group with an ether group.

The method of claims 7 and 31 is taught in col. 21, lines 42-67 and col. 22, lines 1-12 with exposure at 157 nm.

The most preferred mol.wt. of the polymers is 2,000 to 200,000 in the claimed range.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fedynyshyn et al cited above.

Fedynyshyn does not teach the resist composition comprises a basic additive, however, the examiner takes official notice that a basic additive is well known in the art thus does not make the composition novel as one of ordinary skill in the art would add a basic compound to the composition to increase pattern resolution of the CAR.

Allowable Subject Matter

7. Claims 13,15-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach the monomer having R5 as the fluoro groups claimed or a polymer having the additional monomers in claims 15-20.

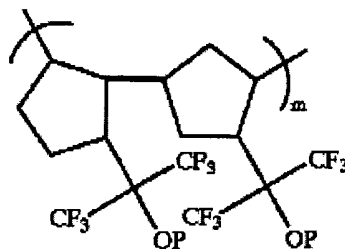
Response to Arguments

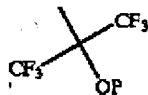
9. Applicant's arguments filed April 6, 2004 have been fully considered but they are not persuasive.

Applicant argues against Fryd by stating the examiner has not shown the provisional document of Fryd had not been demonstrated to teach applicant's invention. The examiner does not need to show this. The provisional document is of public record to applicant.

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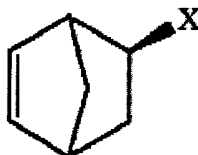
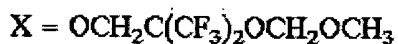
Applicant argues against Fedynyshyn by stating the polymers in examples 2,5 and 9 do not meet the limitations of the amended claims, however, they do. For example, the polymer in ex. 2 is shown below:



The monomer on the left is a cyclopentane monomer which is applicant's monomer (2)-2 in claim 11 wherein R1 is  which is a fluorinated alkyl group with an ether bond as in formula (3)-1

of claim 1.

Applicant also argues against Fryd by stating the polymers do not meet the limitations of formula 1, however, the monomer Nb-F-OMOM has the formula below with X being:



As in Fedynyshyn the Nb monomer meets the limitations of formula (2)-5 and R1 is a fluorinated alkyl group with an ether bond as in formula (3)-1 (see X above).

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10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 571-272-1326. The examiner works a 6 hr. daily work schedule and can normally be reached M-F between 10:00 am and 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached at 571-272-1385.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

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Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

rea
June 26, 2004

ROSEMARY ASHTON
PRIMARY EXAMINER